

GAMMA RAY DETECTORS HAVING IMPROVED SIGNAL-TO-NOISE RATIO AND RELATED SYSTEMS AND METHODS FOR ANALYZING BULK MATERIALS

ABSTRACT

An assembly for detecting gamma rays from a bulk material defines a radiation region. A radiation source is positioned adjacent the radiation region and configured to irradiate the bulk material in the radiation region. A first gamma ray detector is positioned adjacent a side of the radiation region and is configured to detect gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source. A second gamma ray detector is positioned adjacent the first gamma ray detector and configured to detect gamma ray events including events from gamma rays secondarily emitted by the bulk material responsive to radiation from the radiation source. A coincidence module is configured to receive signals indicating gamma ray events from the first and second gamma ray detectors and to identify events that are detected in coincidence in the first and the second gamma ray detectors.